

Fact Sheet
January 2002

Cyanide Waste Produced in Jewelry Manufacturing



JEWELRY MANUFACTURING WASTE STREAM

DTSC is one of six Boards and Departments within the California Environmental Protection Agency. DTSC's mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California



California
Environmental
Protection Agency



What is this waste?

Cyanide, in the form of sodium and potassium cyanide, is used in the jewelry manufacturing industry for electroplating, "cyanide bombing," and metal stripping. These processes generate the following types of hazardous wastes:

- spent* process baths containing cyanide, a high concentration of dissolved metals, and inorganic or organic "brightening" agents;
- spent rinse waters containing cyanide and dissolved metals; and
- sludge and residues from process baths that contain metals and cyanide.

The metals contained in these wastes can include gold, silver, platinum, rhodium, cadmium, copper, nickel, zinc, chrome, and other metals.

Why is this waste hazardous?

Cyanide is a highly toxic substance that will cause death if ingested, inhaled, or absorbed through the skin. In addition, other chemicals used in plating, bombing, and stripping operations, including dissolved metals, are generally harmful to human health and the environment.

Why must this waste be managed safely?

Because this waste is hazardous to human health and the environment, it is important to manage it safely, even if the waste contains precious metals. Current laws and regulations specify how hazardous waste must be managed in order to protect public health and safety, and the environment [1]. These laws and regulations also specify how to recover precious metals from hazardous waste that contains precious metals. Jewelry manufacturers can protect public health and safety, and avoid costly fines and penalties, by managing their hazardous waste in compliance with these laws and regulations.

How should I manage this waste?

If your business generates a hazardous waste, it is your responsibility to ensure that waste is properly managed (please see the Department of Toxic Substances Control (DTSC) fact sheet on "[Hazardous Waste Generator Requirements For Jewelry Mart Operators](#)").

It is unlawful to dump any hazardous waste into the trash or onto the land, or to pour hazardous waste down the sink, into a storm drain, or down the toilet. Your local Certified Unified Program Agency (CUPA) cannot authorize you to treat any hazardous waste that contains cyanide. If you want to treat the hazardous cyanide

** Spent: Something becomes "spent" when it is used up, or when it is no longer useful for its intended purpose. For example, dirty solvent that can no longer be used for cleaning is called "spent" solvent.*

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our web site at www.dtsc.ca.gov.

waste that you generate, you must obtain a permit or grant of authorization from DTSC. Contact DTSC at (800) 728-6942 for assistance. Please see the DTSC fact sheet on "[The Standardized Permit for Building Owners of Jewelry Marts](#)" for information about hazardous waste treatment permits. You must also get a discharge permit from your local wastewater treatment facility if you want to discharge your treated waste to the sewer.

If you do not have a permit or grant of authorization to treat your hazardous cyanide waste onsite[‡], you must send the waste offsite[†] to a facility that has been permitted to treat hazardous cyanide waste. It is unlawful to use the United States Postal Service, any common parcel carrier, or anyone who is not a DTSC-registered transporter to transport your hazardous waste offsite. For information about transport requirements, please see the DTSC fact sheet on "[Hazardous Waste Generator Requirements for Jewelry Mart Operators](#)."

Never allow hazardous waste that contains cyanide to mix with any acid or acidic hazardous waste. If cyanide-containing waste is allowed to mix with acid or acid-containing waste, hydrogen-cyanide gas will form. A few breaths of hydrogen-cyanide gas can kill a person in minutes. A dust mask will not protect against hydrogen cyanide gas. Because cyanide-containing and acidic hazardous wastes create poison gas when they are mixed, they are incompatible wastes. All incompatible hazardous wastes must be separated by a wall, or other suitable barrier, that can keep them from mixing in the event of a spill [2].

Can I reduce or eliminate my cyanide use and cyanide waste?

Yes. Electrostripping and magnetic tumbling are two cost-effective processes that are much safer than cyanide bombing, and reduce the loss of precious metals. While there will be an initial cost for electrostripping or magnetic tumbling equipment, you may offset that cost by holding onto precious metals that would otherwise be lost in your cyanide stripping and bombing operations.

Consider using deoxidizing casting alloys, which may eliminate the need to use cyanide bombing or stripping (please see the DTSC fact sheet on "[Jewelry Manufacturing Industry Pollution Prevention Recommendations](#)"). Deoxidizing casting alloys cost almost the same as non-

deoxidizing alloys, and do not require the purchase of any additional equipment or chemicals.

Cyanide waste is expensive to manage. By eliminating or reducing your use of cyanide, you may reduce your costs and legal responsibility associated with the management and disposal of cyanide waste. The DTSC Office of Pollution Prevention and Technology Development (OPPTD) can help you reduce or eliminate the use of cyanide in your operations. You can contact OPPTD at (800) 700-5854. For more information, see the DTSC fact sheet on "[Jewelry Manufacturing Industry Pollution Prevention Recommendations](#)."

Disclaimer

This fact sheet is intended to provide guidance for managing hazardous cyanide waste. This fact sheet covers only some of the basic management requirements under the Health and Safety Code and the California Code of Regulations. This document does not replace or supersede relevant statutes and regulations. This fact sheet was prepared in January 2002 based on statutes and regulations in effect at that time. Interested parties should always review the most current statutes and regulations.

References

1. Health & Saf. Code, div. 20, ch. 6.5, and Cal. Code Regs., tit. 22, div. 4.5.
2. Cal. Code Regs., tit. 22, section 66265.177.

[‡] "Treatment" is any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose, including, but not limited to, energy recovery, material recovery, or reduction in volume. (Health & Saf. Code, § 25123.5 and Cal. Code Regs., tit. 22, § 66260.10.)

[‡] The term "onsite facility" is summarized for purposes of this fact sheet to mean a hazardous waste facility at which hazardous waste is generated, and which is owned by, leased to, or under the control of the generator of the waste. (Health and Saf. Code, § 25117.12 and Cal. Code Regs., tit. 22, § 66260.10.)

[†] An "offsite facility" means a hazardous waste facility that is not an onsite facility. (Health & Saf. Code, § 25117.11 and Cal. Code Regs., tit. 22, § 66260.10.)

This fact sheet is also available in Armenian, Spanish, and Vietnamese.

Esta información se encuentra disponible también en armenio, español y vietnamita.

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Tài liệu này được viết bằng tiếng Armenia, tiếng Tây Ban Nha và tiếng Việt